

AUG 31 1995



August 29, 1995

Mr. Richard Spiese
State of Vermont
Department of Environmental Conservation
Hazardous Materials Management Division
103 South Main Street / West Office Building
Waterbury, VT 05671-0404

RE: Summary Report on the Investigation of Petroleum Contamination at Chipman Point
Marina, Orwell, Vermont (VTDEC Site #94-1739)

Dear Mr. Spiese:

Enclosed please find the summary report on the investigation of petroleum contamination at the
Chipman Point Marina in Orwell, Vermont.

If you have any questions regarding our findings, please call.

Sincerely,

A handwritten signature in cursive script, appearing to read "Kevin McGraw".

Kevin McGraw
Hydrogeologist

enclosure

**SUMMARY REPORT ON THE
INVESTIGATION OF
PETROLEUM CONTAMINATION**

AT

**CHIPMAN POINT MARINA
ORWELL, VERMONT**

AUGUST 1995

Prepared by:



P.O. Box 943
Williston, Vermont 05495
(802) 865-4288

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Site Map

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I. INTRODUCTION

The following report summarizes the limited investigation of subsurface petroleum contamination conducted at the Chipman Point Marina in Orwell, Vermont (see Site Location Map, Appendix A). This investigation is a follow-on action to the discovery of petroleum-contaminated soils at the site during the removal of underground storage tanks (USTs) in December of 1994. Griffin International, Inc. (Griffin) has conducted this investigation for Mr. Richard Ullom, owner of the Chipman Point Marina. The assessment has been conducted in accordance with Griffin's approved work plan and cost estimate, dated January 16, 1995.

II. SITE BACKGROUND

On December 19, 1994, two (2) 1,000-gallon gasoline USTs and one (1) 1,000-gallon diesel UST were removed from the subsurface at the Chipman Point Marina. These tanks were located on the west side of the marina building, within 5 feet of Lake Champlain (see Site Map, Appendix A). The tanks were partially below the lake level, which was seasonally low, at the time of removal. In the spring, the lake level rises sufficiently to flood the area where the tanks were located. As a result, the seasonal rise and fall of the lake flushes the area around the tanks at least once each year.

The diesel tank, reportedly 10 to 12 years old upon removal, was observed to be in good condition. One of the gasoline tanks, approximately 30 years old, was found to be in poor condition; five (5) 1/4-inch diameter holes were discovered on this tank. The second gasoline tank was in fair condition. Gasoline-contaminated soils were observed beneath both former gasoline tanks. No diesel contamination was observed during the removal of the tanks. Approximately 10 cubic yards of contaminated soils were stockpiled on-site prior to the installation of one 2,000-gallon gasoline UST. On the day the USTs were removed, the Lake Champlain shoreline in the vicinity of the marina was surveyed for signs of petroleum contamination. No sheens, odors or seeps were observed at the edge of the lake.

In response to the subsurface petroleum contamination discovered during the removal of the USTs, the Vermont Department of Environmental Conservation (VTDEC) requested additional investigation at this site to determine the potential for contaminant impact to the lake and other receptors. The following report presents the results of the investigation proposed by Griffin in the work plan and cost estimate submitted to the VTDEC on January 16, 1995.

III. SITE INVESTIGATION

A. Lake Sediment Sampling

The two former gasoline underground storage tanks that are suspected of leaking were located at the immediate edge of Lake Champlain behind a concrete retaining wall. To determine if the lake has been impacted by the contamination on the east side of the retaining wall, five lake

sediment samples were collected along the west side of the wall. A hand auger could not be used to collect these samples due to the presence of primarily gravel and cobbles at the edge of the lake. Instead, grab samples were collected by hand in the five locations marked on the Site Map. Each of these sediment samples were screened for volatile organic compounds (VOCs) using a photoionization device (PID). The screening results for these samples were:

Sample #1:	0.0 parts per million (ppm)
Sample #2:	0.0 ppm
Sample #3:	0.0 ppm
Sample #4:	2.4 ppm
Sample #5:	12 ppm

All of these samples consisted of coarse sand and gravel. Petroleum odors were not detected in samples #1, #2 or #3. Slight weathered petroleum odors were observed in samples #4 and #5, obtained from the west side of the retaining wall closest to the former gasoline tanks. A lake sediment sample was also collected for laboratory analysis from the vicinity of where sample #5 was obtained. This lab sample was analyzed for Total Petroleum Hydrocarbons (TPH) by Modified EPA Method 8100 and specific petroleum compounds by EPA Method 8020.

B. Supply Well Sampling

The closest known sensitive receptor, other than Lake Champlain, is the Chipman Point Marina supply well. A water sample was collected from this well on June 20, 1995. The sample was submitted to a laboratory and analyzed for TPH by Modified EPA Method 8100 and petroleum compounds by EPA Method 8020.

IV. ANALYTICAL RESULTS

A. Lake Sediment

The concentration of total petroleum hydrocarbons in the Lake Champlain sediment sample (sample #5) was 15.6 ppm. Very low concentrations of benzene, toluene, ethylbenzene, xylenes (BTEX) and methyl tert butyl ether (MTBE) were detected in this sample also. Benzene was detected at a concentration of 21.4 parts per billion (ppb). MTBE, a gasoline additive, was detected at a concentration of 56.4 ppb. All laboratory analytical results for the lake sediment sample are presented in Appendix B.

According to the Vermont Hazardous Waste Management Regulations (Section 7-207), wastes are considered hazardous by the characteristic of toxicity if the waste contains contaminants at or above EPA Maximum Contaminant Concentrations. These characteristics are based on the Toxicity Characteristic Leaching Procedure (TCLP). The 8020 analysis performed on the lake sediment sample is a direct method of analysis, which means the reported concentrations of the individual compounds (e.g., BTEX and MTBE) reflects the concentrations of these compounds in the sediment, while the TCLP would report the concentration extracted into a buffer solution.

Benzene was the only compound analyzed for that has a maximum concentration listed for the characteristic of toxicity (0.5 mg/Liter). To determine the (maximum) concentration of benzene which would have resulted from a TCLP analysis, a conversion must be performed. The proper conversion factor to obtain results comparable to a TCLP analysis was provided by Harry Locker, Ph.D., the laboratory director at Endyne Laboratories in Williston, Vermont.

Given that the concentration of benzene in the sediment sample, as determined by the direct method, was 21.4 ug/kg (ppb), the concentration as determined by the TCLP analysis would have likely been no greater than 1.07 ug/L or 0.00107 mg/L. This value is far less than the maximum concentration of 0.5 mg/L (shown in Table 1 of Section 7-207 of the Vermont Hazardous Waste Management Regulations).

The above analysis, although not conclusive, is a strong indication that the sediments sampled at Chipman Point Marina would not likely be considered hazardous waste by the characteristic of toxicity. In addition, the low concentrations of BTEX and MTBE observed in the sediments immediately outside the concrete retaining wall will not likely result in any significant concentrations of these compounds in the lake water itself. Contaminants entering the lake from the vicinity of the former gasoline USTs will likely be diluted to non-detectable levels in the general area of the marina.

B. Supply Well

Dissolved petroleum contamination was not detected in the water sample collected from the Chipman Point Marina supply well by Modified EPA Method 8100 or Method 8020. The laboratory analytical report is included in Appendix B.

V. SENSITIVE RECEPTOR ASSESSMENT

On June 20, 1995, Griffin surveyed the area to identify the location of potential sensitive receptors in the area. The only potential receptors identified were Lake Champlain and the Chipman Point Marina supply well.

The supply well for the marina is located approximately 500 feet east of the former gasoline tanks at the lake's edge (see Area Map, Appendix A). The risk to this supply well is deemed to be minimal at this time. It is highly unlikely that dissolved petroleum contamination from the former or present marina USTs would ever impact this well.

Lake Champlain has likely been impacted to a minimal degree from the gasoline release at this site. Sediment sampling and screening results suggest that only a narrow strip of shoreline has been impacted by the petroleum release. As stated previously, any dissolved contamination in the lake resulting from the gasoline release will likely be reduced to non-detect levels in the vicinity of the marina.

Based on the location of nearby buildings relative to the subsurface contamination, it does not appear that there are any basements in the area that are at risk of petroleum vapor accumulation.

VI. STOCKPILED SOIL SCREENING

On December 19, 1994, approximately 10 cubic yards of petroleum-contaminated soils were stockpiled on-site during the removal of the three former USTs. The soils are currently on plastic sheeting and are covered with plastic sheeting to prevent leaching of contaminants into the surrounding soils. On June 20, 1995, Griffin screened the stockpiled soils for VOCs using a PID. Ten random samples were collected from the center of the soil pile, placed in Ziploc baggies and then screened for VOCs. No VOCs were detected in any of the ten soil samples; all PID readings were 0.0 or 0.2 ppm. The background PID reading at the time of screening was 0.2 ppm. Based on these soil screening results, Griffin recommends that the soils be spread on-site.

VII. CONCLUSIONS

Based on the limited site investigation conducted at the Chipman Point Marina, Griffin has reached the following conclusions:

1. There has been a release of gasoline to the subsurface at Chipman Point Marina which has resulted in adsorbed and dissolved-phase contamination. This contamination likely exists primarily below the water table in the vicinity of the former USTs and at the bottom of the lake. A significant portion of the soil contamination above the water table was removed during excavation of approximately 10 cubic yards of contaminated soil.
2. The low concentrations of BTEX, MTBE and TPH in the lake sediment sample do not likely pose a significant threat to the lake ecosystem. Any petroleum contamination leaching into the lake in the vicinity of the former gasoline USTs is likely reduced to non-detectable levels by dilution. Analysis of lake water directly above these sediments has not been conducted.
3. The concentration of residual petroleum contamination in the soils will reduce naturally over time by the processes of biodegradation and the "flushing action" of rising and falling lake levels.
4. The only apparent effective method of remediation of petroleum contamination in the vicinity of the former USTs is excavation of a portion of the shoreline and dredging of the lake bottom. This option is impractical, however, as shoreline alterations and lake bottom dredging would require significant efforts related to obtaining both state and federal approval. In addition, the level of contamination which exists at this site does not appear to warrant these efforts.
5. The risk to the Chipman Point Marina supply well is likely minimal. It is highly unlikely that this well, located approximately 500 feet physically upgradient from the source area, would ever be impacted by the release of gasoline from the former gasoline USTs.
6. Residual petroleum contamination in the stockpiled contaminated soils has been reduced to non-detectable levels since December of 1994.

VIII. RECOMMENDATIONS

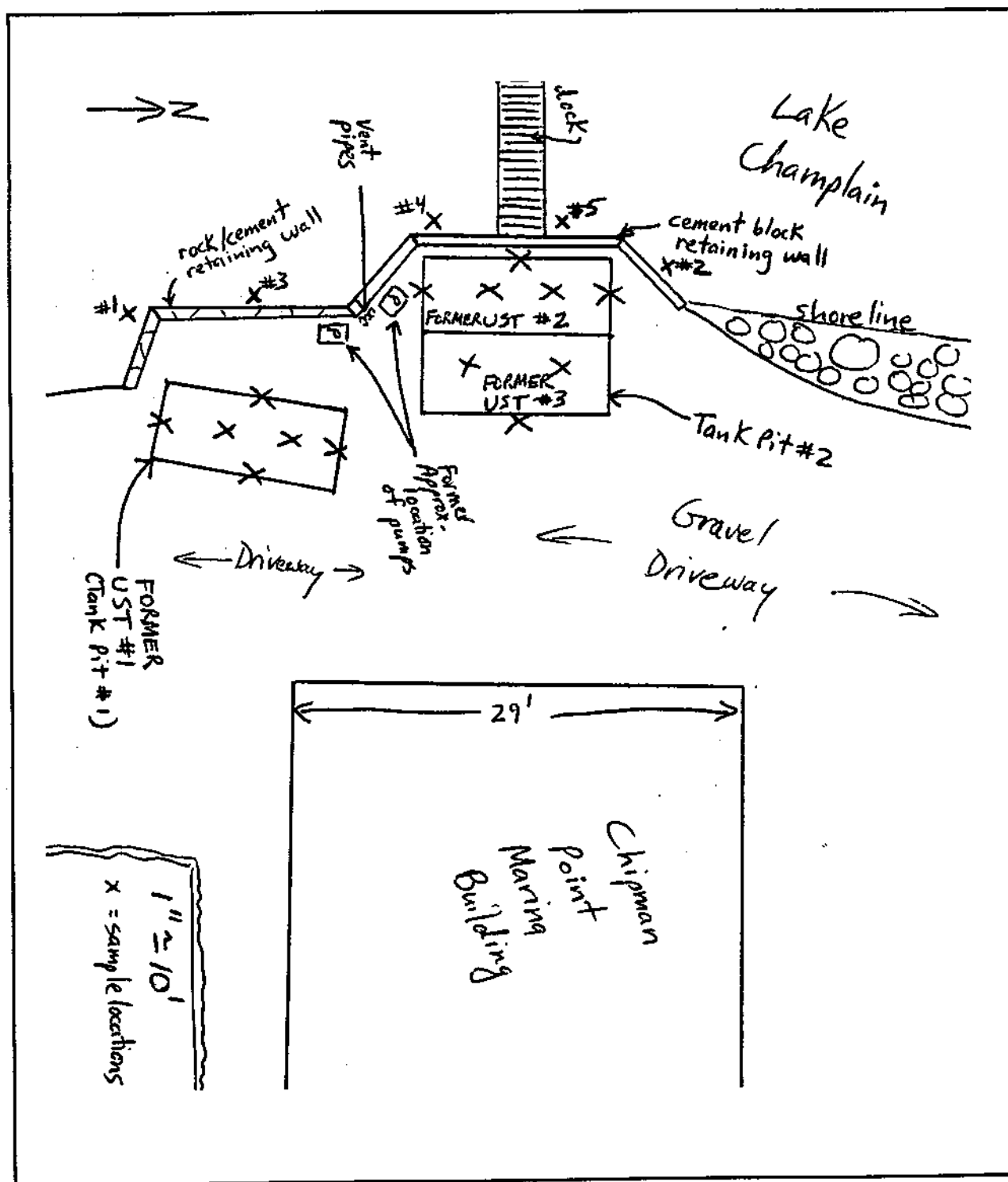
Based on the above conclusions, Griffin does not recommend any additional investigation at this site. The stockpiled soils should be spread on-site since no contamination was detected during the screening conducted in June.

APPENDIX A - MAPS

Site Location Map

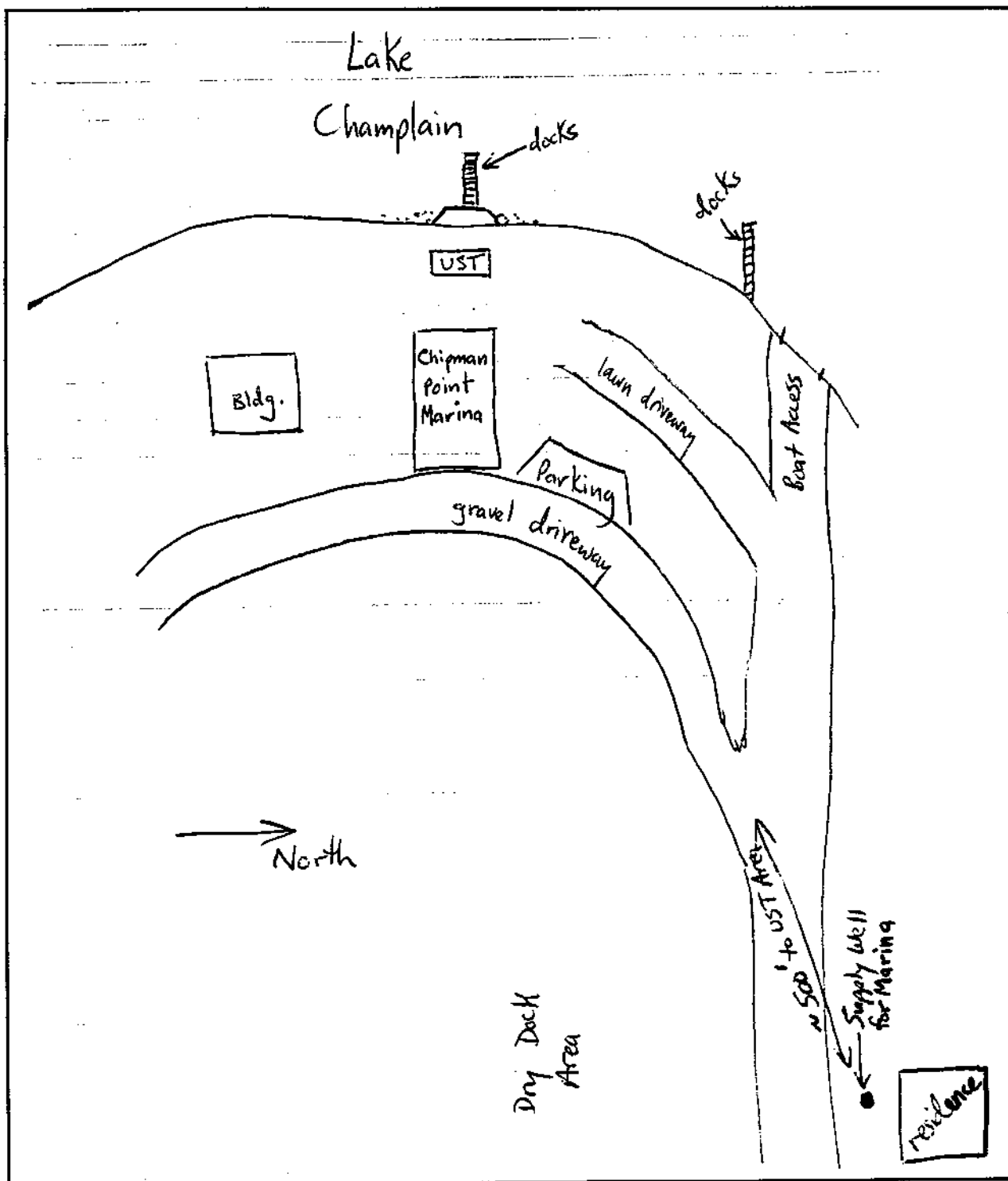
Site Map

Area Map



SITE MAP

Chipman Point Marina
Orwell, Vermont
Scale: 1" = 10'



AREA MAP

Chipman Point Marina
Orwell, Vermont
Not to Scale

APPENDIX B

Laboratory Reports



ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

REPORT OF LABORATORY ANALYSIS

CLIENT: Griffin International
PROJECT NAME: Chipman Point Marina
DATE REPORTED: July 11, 1995
DATE SAMPLED: June 20, 1995

PROJECT CODE: GICP1372
REF. #: 75,937 - 75,938

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody record.

Chain of custody indicated water sample preservation with HCl.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy were monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

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ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

TOTAL PETROLEUM HYDROCARBONS (TPH) BY MODIFIED EPA METHOD 8100

DATE: July 11, 1995
CLIENT: Griffin International
PROJECT: Chipman Point Marina
PROJECT CODE: GICP1372
COLLECTED BY: Kevin McGraw
DATE SAMPLED: June 20, 1995
DATE RECEIVED: June 21, 1995

<u>Reference #</u>	<u>Sample ID</u>	<u>Concentration</u> <u>(mg/kg as received)¹</u>
75,937	Supply Well; 11:30	ND ²
75,938	Sediment Sample #1; 1:45	15.6

Notes:

- 1 Method detection limit is 5.0 mg/kg.
- 2 None Detected. Detection limit for sample 75,937 is 1 mg/L.

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32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333

CHAIN-OF-CUSTODY RECORD

Job# 2954645

14575

Project Name: Chipman Point Marina Site Location: Orwell, VT	Reporting Address: Griffin International	Billing Address: Griffin International
Endyne Project Number: GIC P1372	Company: Griffin International Contact Name/Phone #: Kevin McGraw/865-4288	Sampler Name: Kevin McGraw Phone #: 865-4288

[illegible]

Relinquished by: Signature <i>Kevin McMan</i>	Received by: Signature <i>Beth Ward</i>	Date/Time <i>6-21-95 9:40</i>
Relinquished by: Signature <i>Beth Ward</i>	Received by: Signature <i>Roseann Breen</i>	Date/Time <i>6/21/95 9:45 A.M.</i>
New York State Project: Yes <input type="checkbox"/> No <input type="checkbox"/>		
Requested Analyses		

Requested Analyses											
1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD ₅	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify): OTHER ANALYSES REQUESTED										



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FAX 879-7103

REPORT OF LABORATORY ANALYSIS

CLIENT: Griffin International
PROJECT NAME: Chipman Point Marina
DATE REPORTED: June 29, 1995
DATE SAMPLED: June 20, 1995

PROJECT CODE: GICP1372
REF. #: 75,935 - 75,936

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody record.

Chain of custody indicated the water sample was preserved with HCl.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy were monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Individual sample performance was monitored by the addition of surrogate analytes to each sample. All surrogate data was determined to be within Laboratory QA/QC guidelines unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

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ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Griffin International
PROJECT NAME: Chipman Point Marina
REPORT DATE: June 29, 1995
SAMPLER: Kevin McGraw
DATE SAMPLED: June 20, 1995
DATE RECEIVED: June 21, 1995

PROJECT CODE: GICP1372
ANALYSIS DATE: June 27, 1995
STATION: Supply Well
REF.#: 75,935
TIME SAMPLED: 11:30

<u>Parameter</u>	<u>Detection Limit (ug/L)</u>	<u>Concentration (ug/L)</u>
Benzene	1	ND ¹
Chlorobenzene	2	ND
1,2-Dichlorobenzene	2	ND
1,3-Dichlorobenzene	2	ND
1,4-Dichlorobenzene	2	ND
Ethylbenzene	1	ND
Toluene	2	ND
Xylene	3	ND
MTBE	3	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	108.%
Toluene-d8:	102.%
4-Bromofluorobenzene:	98.%

NOTES:

1 None detected



ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Griffin International
PROJECT NAME: Chipman Point Marina
REPORT DATE: June 29, 1995
SAMPLER: Kevin McGraw
DATE SAMPLED: June 20, 1995
DATE RECEIVED: June 21, 1995

PROJECT CODE: GICP1372
ANALYSIS DATE: June 27, 1995
STATION: Sediment Sample #1
REF.#: 75,936
TIME SAMPLED: 1:45

<u>Parameter</u>	<u>Detection Limit (ug/kg)</u>	<u>Concentration As Received (ug/kg)</u>
Benzene	10	21.4
Chlorobenzene	20	ND ¹
1,2-Dichlorobenzene	20	ND
1,3-Dichlorobenzene	20	ND
1,4-Dichlorobenzene	20	ND
Ethylbenzene	10	25.6
Toluene	10	26.8
Total Xylenes	30	134.
MTBE	30	56.4

NUMBER OF UNIDENTIFIED PEAKS FOUND: 4

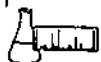
ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane: 87.%
Toluene-d8: 104.%
4-Bromofluorobenzene: 100.%

PERCENT SOLIDS: 80.%

NOTES:

1 None detected



ENDYNE, INC.

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333

CHAIN-OF-CUSTODY RECORD

Job# 2954645

14575

Project Name: <i>Chipman Point Marine</i> Site Location: <i>Orwell, VT</i>	Reporting Address: <i>Griffin International</i>	Billing Address: <i>Griffin International</i>
Endyne Project Number: <i>GICP 1372</i>	Company: <i>Griffin International</i> Contact Name/Phone #: <i>Kevin McGraw/865-4288</i>	Sampler Name: <i>Kevin McGraw</i> Phone #: <i>865-4288</i>

[illegible]

Relinquished by: Signature <i>Kevin McShan</i>	Received by: Signature <i>Beth Ward</i>	Date/Time <i>6-21-95 9:40</i>
Relinquished by: Signature <i>Beth Ward</i>	Received by: Signature <i>Roseann Bosser</i>	Date/Time <i>6/21/95 9:45 A.M.</i>

New York State Project: Yes _____ No _____

Requested Analyses

[illegible]